

MARKETING INNOVATION IN INDIAN PHARMACEUTICAL INDUSTRY

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ABSTRACT

New opportunities and newmarkets are brought about by the changing global environment brings about for domestic firms in developing countries. In the Indian pharmaceutical industry, the impacts of globalization and IPR protection on the innovation are examined, with the help of the firm-level panel data. According to this study, a positive and highly significant level of foreign ownership effect can be found on R&D activities, indicating technology spillover in the Indian pharmaceutical industry. Insignificant effects on R&D innovation are due to TRIPS implementation. In addition, exporting firms and firms with a higher productivity level are significantly more likely to carry out R&D activities.

KEYWORDS: Globalization, Foreign Ownership, Innovation, R&D

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INTRODUCTION

Globalization leading to dumping could adversely affect the production and employment in other countries. Our neighboring country China has already influenced the business of Indian pharmaceutical industry (IPI). For instance, in Andhra Pradesh, Gujarat and Karnataka some large drugs producing units had to stop manufacturing drugs because of dumping (Lalitha, 2002). Business amounting to Rs 2,500 crore a year has been lost by the Indian bulk drugs industry only owing to the importing of cheap bulk drugs from China (Chaudhuri, 2011). Too much dependence on China for importing bulk drugs is the major problem for India. In the production of bulk drugs, China is excelling over India, because of the subsidies provided to the industry by the Chinese government, according to Indian Drug Manufacturers' Association (IDMA) President, S.V. Veeramani. India is planning more funding, subsidies, quicker environmental clearances and so on to extend similar support to pharmaceutical industry.¹

Between these two countries the advantages are different. In China it involves the low-value end, especially of bulk drugs, but in India it is the high value end, especially of generic drugs. According to Edelweiss report of Nov 2014, India has some US-FDA approved facilities, and China has about 600 such US-FDA approved plants. However, India got approvals for more than 300 drug master files (DMFs) accounting for nearly a third in

the US market, whereas China lagged with around 150 DMFs approved. Due to arrest the above-mentioned issues and to move up in higher value chain, pharmaceutical firms in China decided to invest huge amounts of money in the life sciences sector and to scout across the globe for talents. For instance, senior Indian scientists were recruited by Chinese drug firms by paying higher salaries to gain competence in the formulations' segment. Confirming the trend, Director General of India's Pharmaceuticals Export Promotion Council (Pharmexcil), P.V. Appaji told the Economic Times that "*Several instances of certain leading Chinese pharmaceutical firms hiring top Indian pharmaceutical scientists have come to our notice. It could be aimed at augmenting filing of abbreviated new drug applications (ANDAS) in the US and other regulated markets as China is currently building huge capacities to produce copycat medicines. We guess this trend should over a period of time help Indian companies increase their presence in China and vice versa*" (Economic Times, 1st Sep 2015). This approach enabled Chinese pharmaceutical firms to increase filings of ANDAS in the US and other regulated markets. When this is the trend in China, on the other hand, India is trying to cut down on importing raw materials from China. Over the years, Chinese firms have increased significantly their R&D investments. In 2000, it increased from \$162 million to \$3,250 million in 2011.

Data

The annual census data of over 552 pharmaceutical firms has been used for this study, thereby measuring the productivity effects of foreign ownership. The data was obtained from the Center for Monitoring Indian Economy's (CMIE) Prowess Database. Many Indian economy empirical studies have used this database, such as Pradhan (2002), Saranga & Phani (2009), Iyer (2012), and so on. The study period involves from 1999 to 2014. A proxy for foreign ownership 't' in time is the share of foreign equity participation. Its value ranges between 0 and 100 percent. The data on labor input from the Annual Survey of Industries (ASI) was used as their employment number was not disclosed by most of the companies in the CMIE database. The average industry wage rate calculated by dividing the total wage bill of a firm. For the last two years, the ASI has not provided wage rates, and Prowess database provided the labor inputs for these particular years. CMIE's Prowess Database provided capital, size, exports and raw materials of the firm in time 't'. Kyle and McGahan (2008) helped in obtaining TRIPS compliance data.

Specification

Three major hypotheses provides the major determinants of R&D investment. The rate of R&D investment, which is the patent rights protection hypothesis, and the stronger IPRs protection are positively correlated. According to the second hypothesis, the international technology transfer, foreign R&D activities' benefits can be transmitted through trade and FDI and affect domestic R&D investment decisions. According to the third hypothesis, the income growth, the R&D intensity is closely related to income changes (Wang, 2010).

The focus of this study is to understand the evidence on the relations between foreign ownership, IPR protection and innovation. The role of technology in the IPI is an important issue in the firm's productivity growth, as innovation helps the Indian pharmaceuticals firms to stay competitive in the global market. Many empirical studies confirm the positive role of R&D expenditure in explaining firm's productivity growth (see Griliches and Mairesse, 1990; Nadiri, 1993; Wakelin, 2001). It has also been studied whether the foreign ownership improves their technology through innovation, thereby increasing productivity, that is, to confirm the influence of important technological spillovers in the IPI and in turn their influence on the productivity growth of domestic firms. The specification of the estimate is given by

R&D is a dummy equal to one if it has any positive R&D expenditure in time, 't' and zero otherwise ($i = 552$ companies, $t = 1999-2014$). Foreign ownership (indicated by ownership) is defined as the share of foreign equity participation at the firm level in the previous year, which varies between 0 and 100 percent. If foreign ownership in a firm increases that firm's productivity, the resultant coefficient of ownership will be positive. Export is a dummy, 1 indicates a firm exports in time, 't-1' and 0 otherwise. For exports to increase a firm's productivity, it is essential that exports should have positive coefficient. Lagged TFP demonstrated a firm's productivity in the previous year.

CONCLUSIONS

According to the literature on the R&D spillovers, there was a mixed role of R&D spillover effects in developing countries. R&D resources and the costs of R&D determine product innovation (Grossman & Helpman, 1990b). This study also presented an overview of the preferences among MNCs in locating their R&D activities in India. Cost considerations and the availability of a vast pool of human resources attracts MNCs to India. The main aim of this study was to understand the impacts of R&D and IPR protection on the innovation in the IPI. It has been understood that foreign firms encourage domestic pharmaceutical firms to undertake R&D activities and increase their innovative activities. In the long run and through this technology spillover, the industry will become more competitive. This technology spillover might be due to India's comparative advantage. Because of the drop in sales and expiry of patent for blockbuster drugs, foreign MNCs lost their market share and profits, resulting in rising costs and declining R&D revenue.

To obtain monopoly rents from new drug varieties, foreign MNCs might get attracted to invest in R&D activities. The quality of the generic drugs produced by most of the domestic pharmaceutical companies must be high to meet the demand from domestic and foreign consumers. Domestic firms should think more innovative to produce such high-quality products. Hence, to increase their productivity levels, they must invest on R&D activities. To achieve all these, pharmaceutical companies are forced to enter into R&D agreement with leading domestic firms. Tax benefits, grants and soft loans for promoting R&D can play important role in attracting more R&D activities. In India, TRIPS may have provided incentives and confidence to MNCs to take advantage of country's strength in manufacturing and to look for location for R&D. It has been understood that in India domestic firms incur more R&D expenditure inducing high innovative activity and more patents. This is the case with most of the developing countries who introduce patent protection for new drug products, leading to more research on innovation.

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